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Exploring transitions in the peri-urban area

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ABSTRACT *Spatial planners and policy makers currently struggle to understand the peri-urban area, with its mixture of land uses and its transitional status between the urban and the rural. This paper presents the concept of transition, derived from complexity science, to allow planners to analyse peri-urban development in terms of a number of interacting processes, some induced, some evolving autonomously. Drawing on four case studies of European urban regions, the research finds that many of the dynamic processes underlying peri-urban development are not susceptible to the influence of planning agencies. This should enable planners to develop a more adaptive approach in the future, identifying areas where productive and case-specific interventions can be made.*

Keywords: non-linear change, complexity, transition, peri-urban area, adaptive planning

Introduction

The traditional spatial organization of the urban-rural divide, based on a clear distinction between urban and rural functions, is transitioning towards an integrated urban-rural area with various identities (Hidding, 2006; Sieverts, 2003). Therefore, a third type of landscape has emerged in addition to the urban and the rural: the peri-urban area, a transitional zone between the city and its hinterland, which cannot solely be understood in terms of a progressive intensification of urban functions in the rural environment. It is also a dynamic zone where new spatial functions and land-use types arise through interaction between urban and rural elements (Garreau, 1991; Hudalah, 2010). In this paper we focus on understanding these land use dynamics in the multifunctional peri-urban area by proposing a non-linear perspective on peri-urban developments.

Although consensus on the definition of peri-urban area is lacking due to its fuzzy mix of rural and urban attributes (Allen, 2003), some general characteristics can be set out. Often the peri-urban area is under strong urban influence, firstly, because many services and public utilities there are provided by the city nearby, and secondly, because of the significant socioeconomic and cultural effect of the in-flowing urban population (Bocz et

al., 2008; Browder, 2003). Because of a high level of migration, the peri-urban social composition is diverse and changes over time. Moreover, land occupancy has an ongoing and rapidly changing pattern, in which consumption and production activities compete for land. Property speculation is common and illegal building activities are not unknown (Allen, 2003; Bosz et al., 2008). As a result of these dynamic characteristics, peri-urban areas are often fluid by nature. They can be regarded as a heterogeneous mosaic of ecological, agricultural, and urban functions whose composition is continuously changing (Allen, 2003).

Peri-urban areas are not simply places of disorder, but also zones of innovation (Foot, 2000). They have fast growing infrastructure facilities, possess extensive green areas, and have lower land prices compared to the city, creating potential for future multifunctional development. There is also increasing interaction between peri-urban areas, bypassing the core cities, something that illustrates the growing importance of such places (Tacoli, 1998; Van der Valk & Van Dijk, 2009). In sum, a peri-urban area is not only a fluid zone where the urban and the rural meet, but can increasingly be distinguished in terms of its own specific dynamics and characteristics. In other words, the peri-urban area can be seen as a spatial system in its own right.

The increasing complexity of urban-rural relationships in the peri-urban area often results in policymakers being insufficiently equipped to understand and to deal with the accompanying mix of processes (Hudalah & De Roo, 2007; Allen, 2003). Balancing conflicts of interest, competing demands, and the fragmented expansion of the urban fabric requires ongoing planning efforts. One particular difficulty lies in the fragmented and overlapping institutional landscape (Mattingly, 1999), which means that a coherent spatial strategy is generally lacking and that possibilities for representative and participative democratic structures are rare (Aguilar & Ward, 2003). At the same time, it can be argued that the absence of a uniform institutional framework leaves niches for creative innovations, something that often characterises these areas.

In an attempt to strengthen the possibilities of peri-urban planning, various authors have already argued that planners have to abandon their urban or rural bias (Sieverts, 2003; Browder, 2002; UNDP, 2000). Accordingly, Allen (2003) argues that a specific approach, combining attributes from urban, rural, and regional planning, should be developed for managing the peri-urban area. This paper is a modest attempt to contribute to the debate on managing peri-urban areas. It aims to seek for means that can improve the coherency of peri-urban developments without undermining the niche innovations resulting from the dynamic multifunctional landscape.

This paper conceptualises peri-urban areas as dynamic rather than predefined. The peri-urban area is seen as a complex adaptive system, open to external influence and consisting of temporary structures and relationships that co-evolve over time (Portugali, 2006; Wolfram, 2002). As such, it connects to emerging debates within contemporary planning, concerning the fluidity of relations and interactions in planning processes, and the ways in which these processes influence future developments (see e.g. Healey, 2009; Hillier, 2007). This paper places particular emphasis on the non-linear and discontinuous

nature of both induced and autonomous spatial developments in the peri-urban area, exploring peri-urban change as a succession of 'transitions'. The notion of transition is derived from complexity science and enables us to conceptualise various phases in non-linear processes. Categories of conditions for change, and the co-evolution of planning strategies to match, are also identified via case studies of developments in various European city regions that exemplify transitions in urban-rural relationships, generally characterized by a shift from divided urban-rural landscapes to highly integrated urban-rural relationships.

This paper has four parts. The first part briefly introduces the basic notions of complexity science and the mechanisms behind processes of non-linear change. The second part elaborates on transition as a helpful concept in analysing non-linear change and introduces the idea of 'push and pull' factors to explain different drivers for peri-urban developments. In the third part of this paper, the potential of the transition concept to enable an enhanced understanding of peri-urban developments in practice is discussed through an analysis of various case studies of peri-urban developments in city regions across Europe. Finally, in section four we reflect critically on the contribution of the transition concept to enhancing our understanding of peri-urban change in particular, and spatial planning more generally.

Complexity science and non-linear processes of change

Incorporating elements of complexity science helps us to understand the ongoing processes of change in peri-urban areas, and particularly to conceptualize the paths of change through both time and space (Martin & Sunley, 2007). Developments are conceptualised in terms of discontinuous and sometimes unforeseen change, rather than smooth progression (Portugali, 2006), that arises out of the interaction between contextual and local (merely case-specific) processes. In other words, developments are the result of co-evolving interactions between processes at multiple scales (Portugali, 2006; Karmeshu & Jain, 2003). Additionally, the nature of these interactions cannot be fully understood by analysing each of these interactions individually. As O'Sullivan et al. point out: 'The irreducibility of complex phenomena arises because interactions among their constituent elements are non-linear and their properties non-additive' (2006), meaning that there is often no one-to-one relationship between cause and effect (Wezemaal, 2008; Heylighen, 2008). This results in a high degree of uncertainty or 'remote causality' which prevents us from forecasting an indisputable end state.

However, although complexity science may assist us to understand the diversity and changeability of peri-urban areas, and although it is gradually gaining more attention from scholars in planning and planning-related fields (e.g. De Roo, 2010, Rauws & De Roo, 2010; Bertolini, 2007, 2010; Portugali, 2000, 2006; Batty, 2005; Byrne, 1998, 2003, 2005; Allen, 1997), its incorporation into the theoretical frameworks of the field is still in its infancy (Chettiparamb, 2006). Especially in qualitative studies, concepts derived from complexity science are often used in a generic and metaphoric sense (ibid.). To assist the discipline in taking a step beyond this metaphorical level, this paper introduces and operationalises the concept of transition to garner both practical and theoretical insights.

Before further introducing the concept of transition, we first need to explain three basic principles of complexity: context dependency, self-organization, and path dependency. In peri-urban areas, where development is induced by a dynamic mix of urban and rural processes, change rarely has a single cause. Instead, structural change can be seen as an evolutionary process with contextual conditions playing a major role. As emphasized by O'Sullivan et al. (2006), evolutionary developments depend on reinforced interactions between local, case-specific elements and more place-independent, contextual processes, such as macro trends, which help to explain the large context-dependency of peri-urban developments. Additionally, mechanisms of self-organisation and path dependency play a prominent role in deciding how developments evolve in the multilevel landscape.

Self-organization is defined in this study as a process by which interactions within the system lead to the spontaneous emergence of a coherent spatial or organisational structure without outside coordination. Heylighen (2008) argues that in such a situation, no single actor is able to control the development process alone – drivers for change emerge through interactions between actors or agents. Examples are local networks for agritourism organised by farmers, or collective illegal settlements at the urban fringe. Somehow, such structures emerge from the bottom up, amplifying each other without outside coordination. Since peri-urban areas are often institutionally fragmented and lack central coordination on development, better insights may be gained if these developments are seen as (partly) self-organizing.

Complexity science foregrounds developments that are (to a certain extent) path dependent (Martin & Sunley, 2006), meaning that the next stage of a process's development is partially a product of its own historical developments and their related conditions (O'Sullivan et al., 2006). Within spatial development processes, this implies that developments tend both to emerge out of existing structures (urban, morphological, organizational, etc.) and to interlink with ongoing trends. For example, if a regional tram service is developed, using existing rail infrastructure from both the national train network and the inner-city metro lines, the new infrastructure builds on existing structures and connects them. This paper contends that these kind of path-dependent processes are influential on the future directions of developments in the peri-urban area in general. Therefore, not every development path remains open in every situation, on account of earlier compositions (Assche, 2006).

To analyze the peri-urban area as a space that evolves through path-dependent and contextual changes, as well as processes of self-organization, means that it is important to discuss time. Developments that result from self-organizing processes and contextual interferences progress uncertainly and in a non-linear fashion. A process of continuous reorganization, also referred to as co-evolution, takes place, with the consequence of future developments in these areas being rather unpredictable. Regarding these characteristics, it is felt that peri-urban development cannot be managed solely by traditional comprehensive approaches with a focus on command and control, or by strategies that build on collaborative and communicative planning approaches. Therefore, we suggest that alternative strategies, derived from a non-linear perspective, could be

developed by incorporating the concept of transition. These strategies could extend the tools available to planners and policymakers concerned with peri-urban developments.

Theorizing the concept of transition

Non-linearity could be expressed as a process of discontinuous change. In other words, processes of non-linear change vary in speed, intensity, and effect as they evolve. Therefore, successive periods of both high dynamism and relative stability can be recognised. Although the conceptualisation of non-linear changes in complexity science is far from crystallised, scholars have suggested that both the concepts of bifurcation and transition are useful in analysing it (Silva, 2010; Ball, 2004). While bifurcation focuses on the 'before' and 'after' stages, the 'process' of change is the main subject of transition.

A transition could be defined as an emerging process of structural change from one level of relative stability to another, representing the various stages of development affecting the 'system' as a whole. It could provide an alternative perspective on peri-urban transformations from the urban-rural divide to integrated urban-rural areas. Rotmans & Kemp (2003) define a transition as 'a set of interconnected changes, which reinforce each other but take place in different areas, such as technology, economy, institutions, ecology, cultural behaviour and belief systems' (p. 9). Since a transition process can vary in speed, intensity, and effect, its directions are uncertain. Therefore a transition's future is ambiguous and open-ended (Rotmans et al., 2001). It is essentially a co-evolving process influenced by interrelated and multiple causes occurring both at a local and contextual levels.

Seen as a co-evolving process, transition is the result of an accumulation of underlying processes of changes. Consequently, collective attitudes and physical, economic, and social compositions and relations may shift fundamentally and may irreversibly change a system (Vasileiadou & Safarzyńska, 2010). This aids us in understanding that a transition differs from 'just an intensification of development'. It can result in new representations, new strategies, changes in the behaviour of actors, and sometimes in a new framework of understanding (Cummings & Worley, 2001).

The concept of transition has already been used successfully in analysing changes in various spatial planning related systems, such as the transformation of Dutch water policy from a technocratic approach to a more collaborative and participative approach with an focus on the integration of water systems in their spatial and socioeconomic contexts (Van der Brugge et al., 2005). Another example is the ongoing transition of the energy system in various parts of the world, from fossil fuels to renewable energy sources (Rotmans et al., 2000). In line with these examples, this paper focuses on the transition that is fundamentally changing the nature of peri-urban areas.

Rotmans et al. (2001) distinguish four phases in the transition process between the old and new levels of relative stability. In the predevelopment phase (1) the system is in dynamic equilibrium. However, autonomous processes are emerging below the surface and not yet having their effect at a systemic level. During the take-off phase (2) the autonomous processes reinforce each other and together cause the system to be thrown

off balance, 'the state of the system begins to shift' (Loorbach & Rotmans, 2006 p. 190). In the acceleration phase (3) fundamental, irreversible, and multidimensional changes take place on different aggregation levels. The system is still out of balance. Finally, during the stabilisation phase (4), the speed of change decreases and a new level of dynamic equilibrium is reached. The phases of this transition are visualized in Figure 1. The concept of transition, and this distinction between various phases of progress, can provide (general) characteristics of peri-urban change which could offer opportunities for the development of specific planning interventions for particular transition phases.

****Figure 1****

Push and pull mechanisms

In an effort to extend the relevance of the transition concept, we deepen our understanding of the underlying processes causing a transition. We refer to these processes as drivers. As explained above, drivers on multiple levels can be distinguished: as Breman & Mundle (1991) point out, they can include the changing role of the state or the dominant ideology which guides state action, a shift in the balance between social classes, and the economic importance of natural resources or the availability of new technology. More abstractly, Frantzeskaki & De Haan (2009) argue that drivers for transitions emerge when dislocations exist between the functioning of the 'system' and its context (due to internal mismatches), and when competitive alternatives to the 'system' arise.

In order to understand how drivers, both contextual and case-specific, effect a transition, we suggest that they can be viewed as 'push or pull factors'. This may result in insights for planning agencies, allowing them to adapt their strategies and policies to different types of drivers in order to increase their effectiveness. In a transition, some drivers for change can be reinforced, causing ever-increasing changes, while other drivers for change are suppressed, resulting in a movement towards the old level of relative stability. In addition, some drivers for change will push dynamics out of the 'old' level of relative stability, initiating or amplifying a transition (see Garcia, 1999; Lewin, 1992). Others drivers will create pull towards a 'new level of relative stability', or pull dynamics back towards the old level of stability – not wanting to relinquish their previous state (Heylighen, 2008; Zuijderhoudt, 1992). This process is also referred to as dampening (Garcia, 1999; Lewin, 1992). Both situations are visualised in Figures 2 and 3. Conclusively, it provides us with the insight that push and pull factors, as respectively amplifying and dampening structural change, are decisive for the success of a transition.

****Figures 2 and 3****

Some examples of pushes and pulls for peri-urban change can be offered. Sieverts (2003) explains that contextual changes such as increasing car mobility and expanding ICT networks enable dispersed urbanization structures in the peri-urban area. Bryant and Charvet (2003) mention that pushes emerge when peri-urban property markets become part of the metropolitan property market, since peri-urban areas often provide attractive

living environments. Ichikawa et al. (2006) distinguish different possible pushes and pulls for transition in their research of the peri-urban area of Tokyo. They explain that changing socioeconomic conditions, such as shifting agricultural economy and increasing urbanization, push Tokyo's peri-urban development. At the same time, awareness of nature conservation is rising, creating a pull towards a new stability between urbanisation and open space. Similar case-specific and self-organising types of pulls have also been described by Van Dijk & Van der Wulp (2010) in their research on neighbourhood activism in the urban fringe. Hence, peri-urban transitions often occur as a result of the interplay between push and pull related to both contextual trends and case specific processes.

In the previous two sections we have explained the concept of transition as a feature of complex science. We have explored its potential for understanding non-linear change in the peri-urban area. Furthermore, we introduced 'push and pull' factors as drivers for possible transition processes. In the next section the concept of transition is used in an effort to increase our understanding of peri-urban developments and their underlying drivers of various case study regions.

Peri-urban transitions in planning practice

In this section we analyse peri-urban change using the transition concept. The aim is to identify characteristics of transitional change. We focus on interacting contextual and case-related changes, exploring self-organizing and path-dependent developments that create pushes and pulls for peri-urban development. Case study research has been executed in the city regions of The Hague, Leipzig, Montpellier, and Warsaw as part of the PLUREL European research project.¹ First, the research methods used in studying these cases are explained. Then, the various peri-urban developments in these different regions are discussed. However, we offer a fuller application of the transition concept in relation to the Montpellier region. Taken together, the cases provide insights into the transitional characteristics of peri-urban change.

Method

To analyse the processes of peri-urban development in these case study regions, our primary data source was semi-structured interviews with ten to fourteen experts for each area. The interviewees were real estate developers, planning scholars, architects, members of NGOs, and representatives from public spatial planning authorities. They were questioned on the historical, present, and future developments of the urban-rural relationship, the drivers for these changes in their region, and the possible self-organising or contextual characteristics of that change. The results derived from these interviews were cross-checked with additional quantitative data, literature studies, and detailed analyses of two or three local spots within the peri-urban zones. In analysing the case study regions, developments emerging at a higher level are regarded as contextual and more general processes, while local developments are regarded as case-specific

¹ PLUREL: Peri-urban LandUse RELationships (www.plurel.net), Module 3 Governance and Planning, sub-module Chaos and Complexity. European integrated research project within the European Commission's Sixth Framework Programme.

processes. The drivers for peri-urban change derived from these analyses are conceptualized as ‘push and pull’ factors. The case of Montpellier is discussed first.

Montpellier

In Montpellier, located on the south coast of France, a major change in the peri-urban development has been identifiable since the 1960s (Rauws, 2009). Historically, the region was dominated by viticulture and it had a distinctly rural identity (Christopher, 1995; Martin, 1996). The demographic growth rate was low and urban areas barely expanded (Buyck et al., 2008). It has now become a region characterized by increasing urban pressure and a dynamic economy based on services, high technology, and recreation. Moreover, the city of Montpellier and its surroundings have become highly functionally and institutionally integrated. This transition has been influenced by ‘push’ as well as ‘pull’ factors.

A number of interrelated push factors created a take-off away from the old urban-rural divide (± 1962 –1977). Firstly, the sharp decline of the wine industry, as a contextual process, created a push for a transformation of the peri-urban area (Martin, 1996). As the old economic structures came under pressure, new case-specific forerunners appeared, for example the arrival of the computer giant IBM. In combination with the presence of a university, founded in the twelfth century (Buyck et al., 2008), the establishment of IBM provided a potential path for high-tech industrial development in the future. In addition to these developments, the national government introduced ‘Mission Racine’ to link with the emergent leisure economy in Spain (Martin, 1996). This development programme for mass tourism was partially implemented in peri-urban Montpellier. It turned out to be a trigger for the growth of local leisure activities a decade later. Finally, strong demographic growth in the region from the 1960s as a result of contextual changes ‘pushed’ for a move away from a type of spatial organization where urban and rural were still divided. As Laurens (2003) mentions ‘the arrival of new inhabitants diffuses progressively throughout space to such a point that it is difficult to define with precision where the peri-urban zone commences’ (p. 271). Consequently, in Montpellier the urban-rural relationship entered its next phase – acceleration.

During the acceleration phase (± 1977 –2001) the transformation of the urban-rural relationships was characterized by pulls instead of pushes. These pulls were partly the result of transforming the fairly autonomous contextual pushes into case-specific peri-urban development opportunities. They include: co-evolving governmental strategies resulting in the development of ‘Technoparc’ linking with IBM; the construction of the Odysseum, a peripheral commercial and leisure centre; tramlines connecting the surrounding villages with the city of Montpellier; alongside more local, self-organizing innovations that made for urban-rural integration.

One of these self-organising pulls was the urbanization arising from the rapid development of detached family houses in the peri-urban area (Bosc, 2005). This process, referred to as ‘heliotropism’, includes the attraction of wealthy people from the north of France and other European countries to the region because of its Mediterranean climate and pleasant living environment. The construction of new cottages was the result of

individual initiatives and of municipalities handing out plots of land without any overall coordination. This resulted in a scattered pattern of new detached houses in peri-urban Montpellier (Bosc, 2005). As this urbanisation process matured, the scattered cottages often merged into a coherent structure of urban expansions. Another self-organizing pull is the continuing emergence of recreation networks from agriculture companies who seek alternative income (Laurens, 2003). Examples are farms that have developed an educational mission, or agritourism, with special features such as donkey rides and rural festivals (Chiffolleau, 2005; Touzard and Klajman, 2006). These innovations build upon the previously mentioned ‘heliotropism’ almost without coordination, in response to the need for economical restructuring following the wine crisis and the internationally growing tourist industry.

Recently (\pm 2001–present), the development of Montpellier’s peri-urban area seems to have undergone a period of relative stability as a result of institutional and organizational adaptation to the integrated urban–rural relationships. The introduction of the metropolitan government, the Montpellier Agglomération (founded in 2001), the extension of regional tramlines, and the introduction of a regional spatial development strategy (SCOT) in 2006, can be considered as pulls towards a more coherent development of a highly integrated peri-urban area.

Looking back on the development of peri-urban Montpellier, a structural change towards integrated urban-rural relationships has evolved through a set of interwoven processes at various scales, both contextual and case-specific. The identified push factors were to a large extent autonomous, meaning that they were not initiated or implemented by governments directly concerned with the peri-urban. At the same time, the transition of peri-urban Montpellier included self-organizing processes. Moreover, the changing urban-rural relationships in the region appear to be partly path-dependent. Elements of the past, in this case the founding and development of the university, turned out to support the present development of Montpellier into a high-tech industrial centre. Subsequently, the location of the region along the Mediterranean coast and the related pleasant climate gave potential to the development of mass tourism and luxurious living areas in the countryside. In analysing the other city regions we discuss what kinds of similar processes have shaped the development of their peri-urban areas.

Region of Leipzig

In studying the post-war development of the Leipzig region, a decline in traditional economic activities seems to be an important contextual condition for change in the urban-rural relationship. The Leipzig region, located 200 kilometres south of Berlin in the former German Democratic Republic (GDR), has experienced a turbulent development since Second World War. The foundation of the GDR in 1949, and the subsequent fall the regime (1989), had a sizeable impact on peri-urban developments. With the installation of the GDR, parts of peri-urban Leipzig were designated as important production sites for coal by the national government. Further urbanization in these areas was restricted and villages were occasionally removed in order to extend open cast mines (Grimm, 1995). When West and East Germany reunited in 1989 and the mining industry collapsed, the surroundings of Leipzig were open for urbanization. Beside the national

decline of the mining industry as a contextual push, the poor state of the neighbourhoods in the city areas created a case-specific push for the urbanisation of former rural and mining area, amplifying urban-rural integration (Klieverik et al., 2009).

In the following period of peri-urban development, emerging contextual changes created a pull for further urban-rural integration. Like Montpellier, Leipzig witnessed a demand for recreation and an accompanying rise in the leisure economy, both important drivers for change. Nevertheless, due to the influence of case-specific elements and processes, peri-urban developments in Leipzig were different from those in Montpellier: for example, they included the rapid development of shopping malls in the peri-urban area at the beginning of the 1990s. Just after the reunification of East- and West-Germany, spatial planning guidance was rather limited while future expectations about the region's economical development were high. Therefore, a self-organising process emerged where real estate investors developed a vast number of shopping malls in the peri-urban emerged. This resulted in a new, car-dependent, fun-shopping-oriented retail sector (Grimm, 1995). Another development is the recent transformation of the former open cast mines from the GDR period into recreational lakes. This can be seen as a path-dependent process since the historically derived characteristics of the regional landscape profile provided unique potentials to link into the internationally growing leisure industry.

Warsaw region

Similar to the Montpellier and Leipzig regions, a mix of contextual and self-organizing developments created 'pushes and pulls' for the peri-urban development of the Warsaw region (Poland) since the Second World War. During the communist era (1945–1989) contextual drivers were mainly governmentally induced developments while autonomous, market-oriented, developments were suppressed (Beeftink & De Roo, 2009). The national focus on the extensive supply of social housing and investments in heavy industries were therefore the main induced pull factors for Warsaw's peri-urban development over the first half of the communist period. However, during the second half, these same factors became pushes. The centrally planned economy was inefficient and the need to restructure the regional economical structure became increasingly apparent (Lisowski, 2002). Meanwhile, a mismatch was growing between housing developments allowed or enforced by the communist regime – including poor living conditions – and those demanded by society. As a consequence, a self-organizing process involving the construction of single family houses in the surroundings of Warsaw began to influence peri-urban development. Despite the fact that the construction of such dwellings was illegal until 1976 (Crowley, 2003), it is one of the drivers that heralded an era of peri-urban transformation after the fall of communism in 1989.

With the reestablishment of an independent Poland, the contextual and case-specific drivers for peri-urban developments changed rapidly. Prominent contextual pulls in the new period were the excessive demand for 'free consumption' and comfortable living conditions, and the global service economy (Kreja, 2006). This resulted in the development of mixed office and retail facilities along Warsaw's access roads. A case-specific pull can be seen in the migration experienced by the Warsaw region, at the centre of the Polish economy (Lisowski, 2002), as wealthier residents dispersed into single

family dwellings in the peri-urban area. Agricultural areas – which are relatively small in size, privately owned, and run at relatively low profits – are especially vulnerable to this land use change (Bánski, 2006; Szulczewska & Kaliszek, 2008). Hence, the integration of the urban and the rural is mainly driven by the fragmented construction of single family houses and the suburbanization of the retail sector. Currently, leisure activities are less well developed compared to the Leipzig and Montpellier regions.

The Greater Hague region

In contrast with the Warsaw region, the leisure economy is already a pull for peri-urban development in the Greater Hague region. The region is located along the west coast of the Netherlands and has also experienced significant changes since the Second World War, leading to a strongly integrated urban-rural landscape today (Hartman & De Roo, 2009). Due to increasing urban pressure on the rural areas in the region, much of the countryside has been rapidly urbanized, and more traditional land uses, such as dairy farming, have become economically less interesting. Contextual pushes behind this urbanization process include population growth and a decline in household size. As a consequence, the dichotomy of the rural as a production area, and the urban as a consumption area, has started to shift. The open, rural landscapes are no longer appreciated for their agricultural potential, but are increasingly seen as leisure zones.

This potential of the rural areas had already been recognized in 1977 in the establishment of the Midden-Delftland buffer zone, one of the goals of which was to set aside areas for recreation (Staatsblad 1977, 233). However, further substantial leisure developments have been emerging since the 1990s. An example is an indoor ski centre which was established in 1996 on a former landfill site between The Hague and its satellite city, Zoetermeer. This began as an *ad hoc* development, but soon attracted other leisure activities looking for agglomeration advantages. Consequently, a self-organised leisure zone, nowadays called the ‘Big V’, has emerged and urban-rural relationships have become increasingly integrated. The emerging leisure economy has been an important contextual pull, but it is interconnected with more case-specific shifts in conditions and self-organising initiatives. In the next section, the various case studies are compared and possible lessons for understanding peri-urban developments are discussed.

Implications of non-linear peri-urban change for planning theory and practice

There are two crucial conclusions that can be drawn from this comparative analysis of city regions with a non-linear perspective on the peri-urban area. One is about predictability of peri-urban development paths, and the other is about mechanisms managing peri-urban change.

Comparing the changes experienced within the peri-urban areas of the city regions under analysis, commonalities in the various paths of transition become visible. In particular, the explicit amplifying effect of the leisure economy is evident in three of the case studies. The peri-urban area thus proves to be important in its ability to host vital spatial functions within new economies. This leads to the fundamental conclusion that comparison of non-linear developments of the peri-urban makes it possible to envision for individual cases developments to come. For example, while Warsaw’s peri-urban is

highly dynamic and clearly undergoing a transition away from an industrial phase, it has not yet reached the stage of Montpellier, Leipzig and The Hague, where the leisure economy has become a driver. We might expect Warsaw to reach this stage, however, in due course, particularly since comparisons with other areas, such as those found in this paper, may affect decision-making processes influencing its future.

However, this raises a further question: how can we generalize about transition, given the specificity and uniqueness of each individual peri-urban case? We conclude that broad contextual drivers form the link between the various 'independent' cases, gathering momentum to push case-specific initiatives, projects, and actions towards change. Contextual demographic processes, for example, were influential in changing urban-rural relationships in each of the regions. In the Montpellier, Leipzig, and The Hague, the economic decline of the wine industry, mining, and dairy farming did not stand alone, but proved to be representative of a rural economy that no longer possessed the potential to progress in the vicinity of the urban. As a consequence, those spatial functions traditionally dominating the urban hinterlands declined, resulting in peri-urban change. Moreover, the already-mentioned leisure economy turned out to be a driver for increased urban-rural interaction in the same three regions. We can conclude that contextual drivers to a certain extent 'enslave' peri-urban developments throughout Europe (a notion derived from Haken, 1983), resulting in generic patterns of development. Therefore, planning agencies of one region can learn from other European regions in recognizing and understanding the effects of contextual drivers within the peri-urban area with which they are concerned.

However, the uniqueness of each peri-urban area, entrenched in its own specific context, creates specific and diverging paths for unique development in each individual region. For example, the reestablishment of an independent Poland and the rapid economic reorganization of the Warsaw region created unique conditions for rapid peri-urban development. Besides, every region has its own historical path of development in which present and future developments are embedded. The reuse of the former open cast mines as leisure lakes in the Leipzig region illustrates these path-dependent processes. Finally, various self-organising and autonomous processes emerging from within the regions resulted in case-specific drivers for peri-urban development. Examples are the development of a local recreation network in peri-urban Montpellier and the emergence of low-density living areas surrounding the city of Warsaw. Although relevant local drivers often relate closely to contextual drivers for development, every region has its own path of peri-urban development. When managing the peri-urban area, then, planning agencies have to consider general patterns of peri-urban development, case-specific processes, and the developments that emerge from the interaction between the two.

Peri-urban developments therefore both result from, and emerge out of, autonomous processes. As such, it could be beneficial to focus on an alternative method for guiding these processes that can incorporate both the temporality and the dynamics of peri-urban relations and functions. Moreover, the autonomous character of the underlying processes of peri-urban development suggests that planning agencies should not focus on initiating

and controlling peri-urban change, but on accommodating the positive aspects, and mitigating the negative sides, of processes that are emerging.

What should be the focus of such an alternative approach to peri-urban area planning? Traditional technical and comprehensive planning approaches define the *future* states of spatial developments based on *current* determined variables. These approaches are mainly concerned with the question ‘what to plan?’ Contemporary communicative and collaborative approaches have struggled with conflicting interests/values in participative action, conditioned by *particular* geographical and temporal contexts. These approaches emphasize the question ‘with whom to plan?’ In peri-urban areas, evolving by non-linear processes, an additional question becomes essential; ‘how to plan while being adaptive?’ From the cases on offer here, we have identified two major challenges for an adaptive planning approach for the peri-urban area.

First of all, planners have to be conscious of the autonomous nature of drivers for peri-urban development. Analysing the various cases with the ‘push and pull’ framework has taught us that the drivers underlying a development can be different for each phase of a transition. It also showed us that these drivers are often beyond the influence of planning agencies concerned with the peri-urban area. Planning agencies aiming for an adaptive planning approach must take this into account. We have already pointed out the benefits that could be gained by identifying possible contextual drivers for peri-urban development across regions. However, an adaptive approach also requires *context sensitive* regulations, policies, design, and cooperation strategies. Their flexibility would accommodate a range of possible development paths, triggered or influenced by various contextual processes. These contextual influences need to be embraced as stimuli for local innovation, allowing them to trigger a self-organizing chain of events.

However, planning agencies have an essential role in connecting developments emerging as a response to the various autonomous drivers affecting the peri-urban area. There are two reasons why this is critical. First of all, these newly emerging relations and initiatives often show a fragmented pattern. Aiming for a peri-urban environment that is both sustainable and shows spatial quality, planning agencies have to make an effort to connect these developments, and turn them into clustered patterns. Secondly, embedding developments triggered by these autonomous drivers in present environments strengthens an area’s potential to benefit from these drivers. Therefore, multifunctional design, the willingness to connect infrastructure networks, and a desire to stimulate integrated landscapes, are crucial for planning within peri-urban areas, as they have an intrinsic potential for change.

The concept of transition has the potential to provide a holistic view of peri-urban developments over time. This concept may therefore help planning agencies to better adapt to dynamic contextual and local processes. We believe the notion of transition improves our understanding of the ever-changing world around us, helping us to identify the decisive push and pull drivers for contemporary peri-urban development. The first step towards identifying these drivers is understanding the historical paths of comparable regions, as we did in this study. By enhancing peri-urban planning strategies, planning

agencies will have to become aware of the mechanisms of dynamic and autonomous drivers underlying peri-urban development, and the need to be adaptive to these factors promoting change.

Conclusion

Those writing about peri-urban areas desire an enhanced understanding of how these transitional zones emerge in order to develop more suitable planning approaches. In this paper, we suggested that explicit acknowledgement of the changing character of peri-urban areas requires a non-linear perspective that can provide a dynamic instead of static interpretation of their development. We stated that peri-urban transitions are driven by push and pull factors related to various levels of scale, respectively amplifying and dampening peri-urban change.

By analysing peri-urban transitions in various European city regions, this paper illustrates that these drivers are partly path-dependent, and emerge from contextual changes and processes of self-organization. Planning agencies have to be particularly aware of the autonomous characteristics of these drivers. Subsequently, we suggested that peri-urban planning strategies can be strengthened by identifying contextual conditions that allow learning from other regions, by increased sensitivity to context, and by a greater flexibility in promoting autonomous influences. In addition, planning agencies play an important role in connecting and integrating the developments emerging from autonomous drivers with the existing peri-urban functions and relations. This increases the area's potential to benefit from these emerging developments. While acknowledging the importance of autonomous processes underlying peri-urban transformations, the call for a more adaptive approach to planning becomes increasingly clear.

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Figure 1

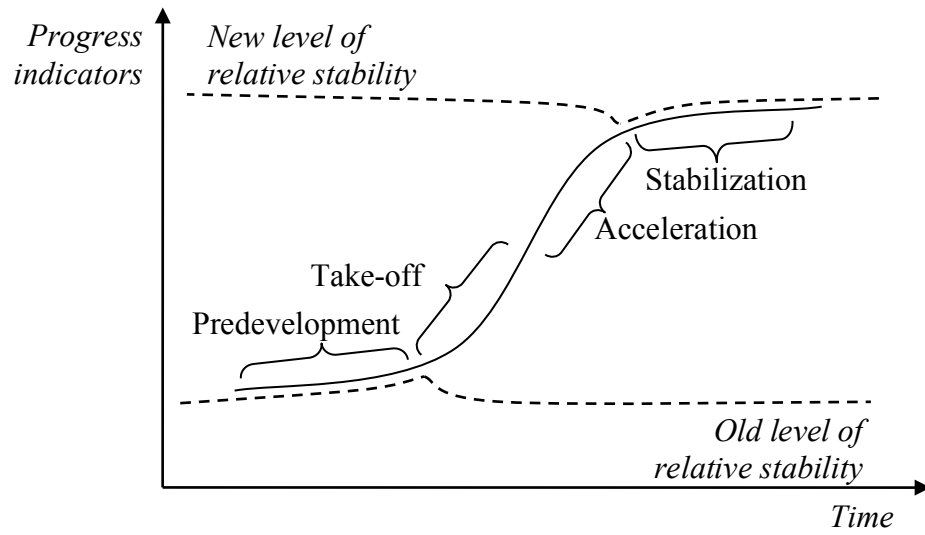


Figure 1: A basic representation of transition process. Beside the illustrated transition, also a structural change to a lower level of stability is possible. (Rotmans et al. 2001 p.3, modified by Hudalah & De Roo, 2007)

Figures 2 and 3

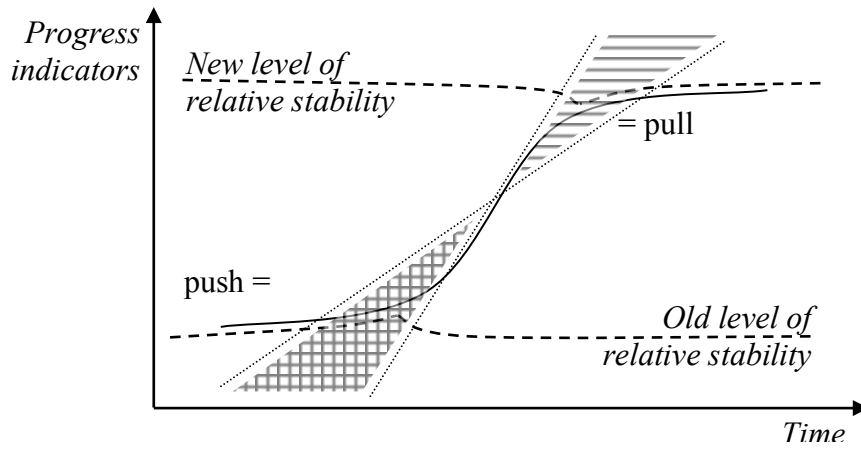


Figure 2 From 'push' to 'pull'. Push factors are processes amplifying change, away from the current 'level of stability'. Pull factors are dampen change, facilitating the reach of a new 'level of relative stability'

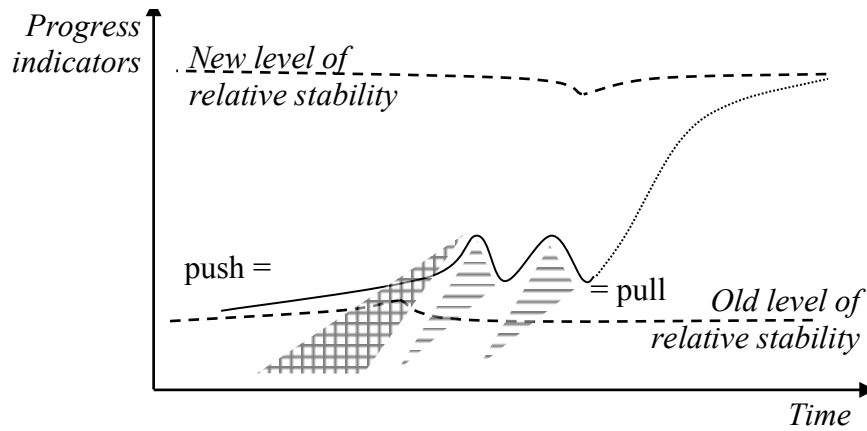


Figure 3 'Pull' to the old level of relative stability. The system suppresses innovative development from breaking with the current level of stability.